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Humanity is not prepared to colonize Mars

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ABSTRACT

The idea of colonizing Mars as an opportunity to sustain the human species is a popular one currently. However, it is based on false premises and ignores the abundant evidence demonstrating that our species is not capable of living on any planet sustainably. Human psychology, and the problems associated with our species' biases and cognitive limitations, will follow us to any planet and replicate the same issues we face on earth.

1. The urgent need to escape ourselves

Many scientists, engineers, futurists, space explorers and members of the public promote the idea that our species should colonize Mars. They believe that we have a mandate to explore and live upon other worlds and some even see it as an urgent imperative because the earth is fast reaching a point of unsustainability for life. The most active and visible proponent of this idea is Elon Musk, who has stated:

> Ultimately, the thing that is super important in the grand scale of history is, are we on a path to becoming a multi-planet species or not. If we're not, that's not a very bright future. We'll just be hanging out on Earth until some eventual calamity claims us.
> – Elon Musk

In Musk's view we need a back-up planet. But he doesn't acknowledge that we ourselves are the cause of this dire situation. And therein lies the problem and the reason we, as a species, have no business trying to colonize another planet. Musk's reason for wanting to colonize Mars is to save ourselves from ourselves and it is self-evident that this alone recommends we should not be going anywhere.

Let's examine the facts through analogy. It would seem to me that if you apply for any job whatsoever you should be qualified. Company manager? Check. Anesthesiologist? Check. Car mechanic? Check. Going to Mars is a big job but it's still a job. So, what are humanity's qualifications? Let's look at the reality of who we are and the misguided assumptions that shape our thinking on the matter.

2. Humanity's track record

What is our species' qualifications for eking out a sustainable life on Mars? The best predictor of future behavior is past behavior. So let's take a look at just a small fraction of the "lines on our species' resume".

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2.1. Human-overpopulation

Overpopulation occurs when a species' population exceeds the carrying capacity of its ecological niche. When this happens there is a scarcity of space, resources; other species are crowded out and eventually disappear. Overpopulation is not just about the numbers of humans on the planet but about how we use our environment, i.e. over-exploitation, over-consumption and inefficient waste management. And all of these factors are central to the sustainability of the planet, and the survival of other species as well as our own of over 7 billion and rising.

2.1.1. Facts

- Human population continues to grow unchecked while crowding out the world's biodiversity causing a precipitous decline in number of species around the globe (Crist, Mora, & Engelman, 2017).
- Humanity is currently using the equivalent of 1.7 earths to provide the resources we use and absorb our waste (Global Footprint Network, 2018, https://www.footprintnetwork.org/).
- Human population growth and misuse of non-renewable resources is directly and indirectly causing increasingly-severe global deficits in economic equity, access to food and water, quality of life, and political stability, and an increase in violent conflict (Harris, 2000).

2.2. Global climate change, pollution and resource obliteration

Musk's argument is shored up by the frightening prospect of dwindling earthly resources but silent on the fact that we are the cause. The sustainability of any human activity has to do with how we manage resources and waste products over time. The human track record on this score is a grim substantiation that we are unable and/or unwilling to control ourselves.

Facts:

- Our species is responsible for a current global warming trend that is causing increasing impacts on average land and ocean temperatures, stability of sea levels, glacial movements, weather, and levels of ocean acidification, to name just a few of the many interrelated effects. (National Aeronautics & Space Administration, 2018, https://climate.nasa.gov/evidence/).
- Animal agriculture, i.e. intensive animal farming, contributes over 18% of greenhouse gases to the environment, exceeding all cars, trains and airplanes combined (O'Mara, 2011).
- We use 70% of the planet's fresh water to raise animals for food, creating crises in drinkable water for many human populations around the world. There are currently 350 million people at risk of losing access to drinking water (Earthscan, 2007).
- Our continued over-fishing of the oceans has led to the prediction of a global fisheries collapse by 2048 (Worm & Branch, 2012; Worm et al., 2006).
- And in our "disposable society" over five trillion pieces of plastic weighing over 250,000 tons floats in convergence zones (gyres) in the world's oceans wreaking havoc on marine ecosystems and causing harm to marine animals from zooplankton to cetaceans to seabirds and reptiles (Eriksen, Lebreton, Carson, Thiel, & Moore, 2014). By 2050 the oceans will contain more plastic than fish by weight (World Economic Forum, 2016; Anonymous, 2019 https://www.ellenmacarthurfoundation.org/assets/downloads/publications/NPEC-Hybrid_English_22-11-17_Digital.pdf).

2.3. Mass extinction

While species extinctions occur on a regular basis (background extinction) an "extinction event" is different. An extinction event (also known as a mass extinction or biotic crisis) is a widespread and rapid decrease in the number of species which exceeds the rate of speciation at significantly greater levels than the background extinction rate. The sixth extinction or Anthropocene extinction is the ongoing extinction event of species mainly as a result of human activity (Kolbert, 2014). The current rate of extinction of species is estimated at 100′s to 1,000′s of times higher than natural background rates (Pimm, Russell, Gittleman, & Brooks, 1995; Ripple et al., 2017). Our species, thus far, has simply been unable to live sustainably with other animals on this planet.

2.3.1. Facts

- Nearly a third of the total number of species on earth are threatened with extinction, including 41% of amphibian species, 33% of reef building corals, 30% of conifers, 25% of mammals, 13% of birds and one in five plant species. The 2018 update is worse. We are now losing three species per hour (IUCN, 2018, http://www.iucnredlist.org/about/summary-statistics)
- Deforestation (to clear land for animal agriculture and for timber) is one of the main causes of the continued mass extinction event. Forest destruction in Brazil from 1995 to 2000 averaged almost two million hectares a year, which is equivalent to seven football fields a minute (Smithsonian Institution, 2002). Today, we are destroying 27 "soccer fields" of forest every minute globally and an estimated 100 species of plants and animals go extinct every day because of this activity (World Wildlife Fund, 2018, https://www.worldwildlife.org/threats/deforestation).
- In the past decade, wildlife trafficking – the poaching or other taking of protected species and the illegal trade in wildlife and their body parts and products – has escalated into an international crisis. In the last century, rampant ivory poaching, killing for meat,

and habitat loss caused African elephant numbers to drop from over ten million animals in 1900 to fewer than 500,000 by the late 1980's (U.S. Fish & Wildlife Service, 2014, https://www.fws.gov/international/pdf/factsheet-african-elephant.pdf). And our closest relatives, the great apes, are being decimated by poaching for meat, the human pet trade, wildlife trafficking for zoos and tourist attractions. More than 22,000 apes were killed or captured to be sold between 2005 and 2011 (https://blogs.scientificamerican.com/extinction-countdown/great-apes-thousdands-poached-stolen/). This activity is growing – not slowing down.

Is this the resume of a species ready to colonize another planet? Going back to our analogy, arguing that our species is qualified to colonize Mars is like arguing for the qualifications of the company manager who lacks organizational skills, the anesthesiologist who loses every other patient he "puts under", and the car mechanic who never worked on a carburetor.

3. False and dangerous premises

But the mythology of Mars colonization remains popular and is premised upon several unsupported assumptions used to counter the above problems:

- We have learned our lesson on earth and will do better the next time.
- The people who colonize Mars will not fall prey to the same problems we've been vulnerable to throughout human history. Human psychology will change.
- We can reconstitute what we lost, including extinct plants and animals.
- Bottom line: The earth and its inhabitants are disposable and *we can start all over again*.

Our species is so fatally hubristic that we continue to imagine that we can live sustainably on Mars – a place inhospitable to our species – despite the fact that we cannot do so on earth – the planet that we evolved on and are adapted to.

Ironically, if we continue along the same trajectory – creating zones of ecosystem destruction known as dead zones – we will not need to go to Mars to meet the challenge of existence on an entirely inhospitable planet.

4. Wherever you go – there you are

The problem with thinking we can colonize Mars is that wherever you go, there you are. There is no getting away from ourselves. The same human brain (and psychology) that created a situation on earth compelling us to try to start over on Mars is to confront the very question of whether the planet can be retooled to become something it is not. And, unfortunately, it isn't even as conceivable as picking up the qualifications for being a company manager, anesthesiologist, or car mechanic. It is qualitatively more difficult; there is no evidence that we can change who we are that dramatically.

A statement by Bas Londorp perfectly captures our inability to get away from our own hubris:

> If humanity can send humans to Mars, is there anything we cannot do?
> -Bas Londorp, MarsfortheMany.com

The answer is yes, there is indeed one thing we cannot seem to do – live on earth sustainably.

We are not psychologically equipped to be a "multi-planet species" but we can use this knowledge to try to make a go of it on the one planet that we have any chance of thriving on – earth.

It is time for our species to stop playing Buck Rogers and get to the task of saving our own planet.

As David Attenborough comments:

> It's time we humans came to our senses.
> – David Attenborough.

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